**NERRS Science Collaborative Progress Report for the Period 09/15/10 through 02/28/11**

**Project Title:** Determining the role of estuarine 'swashes' on water quality impairment along the Grand Strand of South Carolina: Impacts of land use and stormwater runoff.
**Principal Investigator(s):** Dr. Erik M. Smith
**Project start date:** September 15, 2010
**Report compiled by:** Dr. Erik M. Smith
**Contributing team members and their role in the project:**
M. Richard DeVoe – Integration Co-lead
Dr. Denise M. Sanger – Integration Co-lead
Leigh Wood – local outreach facilitation
Dr. Susan Libes – Research Co-PI
Dr. Richard Viso – Research Co-PI
Dr. Richard Peterson – Research Co-PI
Dr. Jennifer Plunket – Research Co-PI

**A. Progress overview:** The overall project goal is to address how land use attributes and stormwater management practices and conveyance within swash watersheds affect nutrient and organic matter loading to those swashes, their internal transformations, and subsequent export to the coastal ocean. The ultimate intent is to enable effective management strategies, based on sound science, that improve and protect coastal water quality, particularly with respect to hypoxia, in Long Bay. To do so, the following key project objectives have been identified: 1) Work with intended users to define and develop a categorization scheme for all 14 swashes and select 4 swashes for intensive investigation during the proposed study; 2) Quantify concentrations and forms of nutrient and organic matter entering swashes via surface water and groundwater inputs; 3) Determine internal conditions and processes affecting organic matter transport and transformations in swashes; 4) Quantify the form and net tidal export of nutrients and organic matter from swashes; 5) Engage intended users to enable use of data to collaboratively develop science-based cost-effective management strategies.

To accomplish the above project goal, our intention during this reporting period was to convene a workshop with intended users (both those previously identified in the proposal and a larger group of potentially interested stakeholders) to engage the larger community in the project and its goals and rationale; vet the experimental approach and sampling design of the project with this community of intended users; gather relevant land use and stormwater infrastructure from the intended users to use in the development of the swash categorization scheme; develop a swash categorization scheme and work collaboratively to select study swashes based on the categorization scheme. A workshop with intended users was held on November 30, 2010. Land use and stormwater GIS data was collected from key intended users over the months of November to January. A research PI meeting was held on January 13, 2011 to discuss issues with GIS data gathering and develop an approach to categorization development based on available data. A meeting with select intended user data providers was held February 3, 2011 to review data sources and uncertainties associated with previous drainage basin analyses. Swash drainage basin delineations were refined in collaboration with key intended users and land use and other data were clipped to those delineations. These are currently being used in the development of the categorization scheme, which is still under development.

**B. Working with Intended Users:** A workshop with intended users was held on November 30, 2010 to re-engage the initial intended users involved in the development of the proposal, as well as engage a broader community of intended users that would benefit from hearing about the

project and potentially wish to become actively involved in the project. The participants at that workshop, other than the project research team, were as follows:
Kevin Blayton, City of North Myrtle Beach
Janet Wood, City of Myrtle Beach
Dave Fuss, Horry County Stormwater
Jake Carter, Horry County Stormwater
John Adair, Town of Surfside Beach
Karen Fuss, Coastal Wacammaw Stormwater Education Committee
Tom Garigen, Horry County Stormwater
Sean Torrens, SC Department of Health and Environmental Control
David Whitaker, SC Department of Health and Environmental Control
Amanda Ley, SC Department of Health and Environmental Control
David Chestnut, SC Department of Health and Environmental Control
Shannon Berry, SC Department of Health and Environmental Control
Diane Maskow-MeKenzie, City of Myrtle Beach
Keith Walters, Coastal Carolina University
Caitlin Wessel, Coastal Carolina University
April Turner, SC Sea Grant Consortium

Workshop participants were provided with a summary of the current understanding of hypoxia formation in nearshore waters of Long Bay, and the evidence to date suggesting a role of swashes in delivery of organic matter and nutrient forms supporting the formation of hypoxia (the ultimate management issue driving this project); an overview of the project goals, specific objectives, tasks, experimental and sampling designs, and key limitations and uncertainties inherent in the project and its design and anticipated outcomes. Intended users were specifically asked for input on the research team's selection of the total number and location of swashes, to confirm that all swashes were represented, properly identified and that no potential swashes were omitted. Intended users were then asked to review and provide input on the research team's proposed list of potential categorization criteria for swashes and what GIS data they could provide to populate the categorization criteria scheme.

Intended participants were specifically given the opportunity to express concerns with the project and to suggest changes to project tasks, sampling design, and/or methods for integrating intended user involvement on the project. All intended users expressed enthusiasm for the overall project scope and design and at this point interactions with intended users have not resulted in significant changes to the proposed research plan or method of integration with intended users. Discussions regarding the list of all possible swashes resulted in some minor changes to naming conventions and the addition of a possible swash. Several suggestions were made regarding potential swash classification criteria.

As a result of the workshop, a website (hosted by Basecamp) has been set up so that all research PIs and intended users can access all workshop materials, compiled data and existing reports in one central location that can facilitate the open exchange of information and ideas between all project members.

A NERRS CTP-style workshop evaluation was distributed at the completion of the workshop and responses were all very favorable. Evaluation results were provided to the NERRS Science Collaborative via Kalle Matso.

A follow-up meeting with intended users is planned for end of March or early April to present a 'straw man' swash classification scheme to the intended users, vet and formalize the scheme, then use that finalized scheme to collaboratively select the 4 swashes for intensive study.

**C. Progress on project objectives for this reporting period:** GIS data and ancillary information and existing reports have been provided by Horry County, the City of North Myrtle Beach, the City of Myrtle Beach, and the town of Surfside Beach. These data are being compiled and used in the creation of a swash categorization scheme, which is currently under development. Progress on this has been slower than anticipated due to difficulty establishing swash drainage areas from available lidar and stormwater infrastructure data. The research team (led by Dr. Jennifer Plunket) has been working with intended users (principally Tom Garigen of Horry County) to finalize a reasonable and mutually acceptable approach to determining drainage areas for the purpose of swash categorization. This is now complete and land use and stormwater infrastructure information has now been clipped to those boundaries and the research team is working to incorporate this into a classification scheme. A research technician was hired in February to work on the project. Major equipment necessary for field sampling is currently being purchased and assembled.

Plans for meeting project objective for the next six months include finalizing the categorization scheme and 4 study swashes in collaboration with intended users at the next workshop; finalizing sampling plans and installing sampling infrastructure in selected swashes and commencing bimonthly swash sampling.

**D. Benefit to NERRS and NOAA:** None at this time.

**E. Other:** No other activities, products, accomplishments, or obstacles have been identified at this time.